COUNCIL COMMUNICATION

TO: THE CITY COUNCIL	COUNCIL MEETING DATE	NO.
FROM: THE CITY MANAGER'S OFFICE	DECEMBER 20, 1989	

SUBJECT: SPECIFICATIONS AND ADVERTISEMENT FOR BIDS FOR THE PURCHASE OF PRIMARY OVERHEAD, PRIMARY UNDERGROUND, AND SECONDARY UNDERGROUND ELECTRICAL CABLE

RECOMMENDED ACTION: That the City Council approve the specifications and authorize the advertisement for bids for the purchase of various sizes of overhead and underground conductor as detailed below:

Primary Overhead Conductor	
#4/0 Bare Aluminum	14,000 feet
#477 Bare Aluminum	45,000 feet
15KV Concentric Primary Underground Conductor	
#2AWG, Jacketed	25,000 feet
#2/0AWG	20,000 feet
#750 KCM	20,000 feet
#1000 KCM, Jacketed	22,000 feet
Secondary Underground Conductor	
#350 KCM Triplex	20,000 feet

BACKGROUND INFORMATION: The overhead conductor is being purchased to support planned distribution system improvements budgeted for this fiscal year, and to provide an inventory of cable to cover other needs as they develop. The improvements are expected to require about 12,000 feet of #4/0 and 33,000 feet of #477 conductor.

The underground primary cable is being purchased to support projects in the Sunwest subdivisions, the Kettleman Lane/Lower Sacramento Road development, at the substations, and in budgeted distribution system improvements. These specific needs are expected to take about 15,000 feet of #2AWG, 7,000 feet of #2/0AWG, 10,000 feet of #750KCM, and 16,000 feet of #1000KCM. The balance of the quantities purchased would provide an inventory to cover other requirements as they develop.

The #350KCM Triplex is being purchased mainly to re-establish a working inventory, although about 3,000 feet is planned for use in the Sunwest subdivisions.

The anticipated cost of this purchase is about $235,000; funding is available in the Electric Utility Department's Operating Fund.

The bid opening date has been set for Tuesday, January 16, 1990.

Joel E. Harris,
Purchasing Officer

cc: Electric Utility Director
Assistant Electric Utility Director
Electrical Engineer

EQUIPMENT SPECIFICATION

OVERHEAD CONDUCTORS, 477.0 KCM, BARE ALUMINUM (AAC)

GENERAL:

This specification is for stranded aluminum overhead conductor, suitable for use in the City of Lodi's 12.0 kv overhead distribution system.

SPECIFIC SPECIFICATIONS:

477.0 KCM all aluminum conductor (AAC), 19 strand, Class AA. Code Name: COSMOS.

STANDARDS:

The conductor shall meet the requirements of the latest edition of the applicable NEMA, ASTM and ANSI standards, unless otherwise noted in this specification.

SHIPPING:

Conductor to come in reels of 8,000 feet (nominal). Each end of the conductor shall be firmly secured to the reel. No lagging is required. All shipments shall be prepaid, F.O.B. Lodi, Califorsia. Reels shall be shipped upright.

REEL MARKING:

Each reel shall be marked with a durable label securely attached to a flange of the reel and plainly marked stating the destination, the purchaser's order number, shipping length of conductor on reel, weight of reel (tare weight), total weight of the conductor on reel, type and size of conductor and code name.

MAKE UP AND LENGTHS:

NEMA standard code reel #6628 (66 in. flange diameter, 28 in. traverse width) shall be used. Conductor length on each reel shall be 8,000 feet (nominal).

CITY OF LODI ELECTRIC UTILITY DEPARTMENT				ENGINEERING STANDARD OVERHEAD CONDUCTOR, PRIMARY, 477.0 KCM	
8/11/87		[signature]	[signature]	[signature]	SHEET 1 OF 1
DATE	DRAWN	CHECKED	STD. COMM. CHAIRMAN	APPROVAL	REVISION

CITY OF LODI ELECTRIC **UTILITY** DEPARTMENT

EQUIPMENT SPECIFICATIONS

15-KV, XLPE INSULATED, JACKETED, CONCENTRIC NEUTRAL CABLE

1.0 GENERAL

Cable furnished under these specifications shall be limited to cross-linked thermosetting polyethylene (XLPE) insulated concentric neutral cable rated 15,000 volts and suitable fcr installation in ducts or for direct burial in earth, in wet or dry locations, with normal conductor temperatures up to 90°C. Cables furnished shall meet the requirements of the applicable NEMA, ICEA, AEIC and **ASTM** Standards, latest edition thereof, unless otherwise noted in this Specification.

2.0 CABLE

A. Conductor

Insulated conductor shall be aluminum alloy, **EC** Grade, Class B standard or compressed strand, three-quarter or half hard.

B. Conductor Shield

The conductor (strand) shielding shall **be** extruded and shall consist of virgin **black** semi-conducting cross-linked, thermosetting polyethylene. The extruded shield shall have an average thickness of not less thar 15 mils when measured over *the* top of the strands and a minimum thickness of not less than 12 mils. The outer surface of the conductor shield shall be cylindrical and shall be firmly bonded to the overlaying insulation.

C. Insulation

Insulation shall be unfilled, semi-transparent, cross-linked polyethylene extruded directly over the conductor shield. The average insulation thickness shall not be less than 220 mils and the minimum thickness shall not be less than 50% of this value.

D. Insulation Shield

The insulation shielding shall be extruded and shall consist of one layer of virgin black semi-conducting polyethylene or semi-conducting cross-linked polyethylene, compatible with and extruded over the insulation. It shall maintain its shielding properties after exposure to normal operating temperatures and environs. The thickness of the insulation shield shall be in accordance with Table I below.

TABLE I

Diameter of Care (Inches)	Thickness of Extruded Insulation Shield (Mils)	
	Average	Minimum
0 - 1.000	3G	24
1.001 - 1.500	50	40
1.501 - 2.000	70	56

E. Construction Method

Conductor shield, insulation and insulat on shield sha 1 be installed on the conductor using the triple extruding, dry cure me :hod.

F. Concentric Neutra.1

The concentric conductor shall be composed of a number of round annealed bare (uncoated) copper wires helically wrapped around the cable. The number and size of the neutral wires shall be as spec.fied in Table II. The length of lay shall not be less than 6 nor more than 10 times the diameter over the concentric wires.

G. Testing and Guarantee

Testing of cable shall be performed according to procedures set forth by the ICEA, AEIC and ASTM Standards. Certified copies of pass/fail test results shall be supplied. Any cable found defective either upon inspection, testing or installation will be returned at the manufacturer's expense.

H. Overall Jacket

An extruded, encapsulating and insulating layer of linear, low density black polyethylene, (Union Carbide DFDB 6425 or approved equivalent) shall be applied over the concentric neutral wires in accordance with ICEA 5-66-524, Part 4.3, except where modified by this Specification. The minimum thicknesses of this encapsulating jacket over the concentric wires are as follows:

Conductor Size (AWG or KCM)	Minimum Thickness (Mils)
82	50
#2/0	80
750 & 1,000	110

I. Specific Requirements

Any conditions1 bids such as "subject to availability in stock" will be rejected. Cable shall be furnished according to Table II below:

TABLE II

Conductor Size AWG or KCM (No. of Strands)	Conc. Neutral Size - AWG (Min. No. of Wires)	Material Phase (Neut.)	Insulation Thick. (Mils)	NEMA Real Code Number
#2 (7)	f14 (10)	Alum. (Cu)	220	5832
#2/0 (19)	#14 (9)/#12 (6)	Alum. (Cu)	220	5832
750 (61)	f12 (24)/#10 (15)	Alum. (Cu)	220	7848
1,000 (61)	#10 (20)	Alum. (Cu)	220	7848

NOTE: Refer to proposal forms for specific sizes and quantities.

J. **Reels**

1. Makeup and Length:

Cable length on each reel shall **be** in accordance with Table III below:

TABLE III

Conductor Size (AWG cr KCM)	Cable Length (Feet)
#2	4,000 ± 4%
#2/0	2,500 ± 4%
750	2,500 ± 4%
1,000	2,000 ± 4%

2. Packaping:

Each cable reel shall have adequate protective covering across the flanges. Such covering to consist of wood members from flange to f1ange covering the entire circumference of the reel (1agging). The lagging shall be nailed to the flange perimeters and shall be further secured with at least two steel bands around the reel. Each end of the cable shall **be** firmly secured to the reel.

3. Marking:

Each reel shall **be** marked with a durable label securely attached to a flange of the reel and plainly marked stating the destination, the purchaser's order number, shipping length of cable on reel , weight of reel (tare weight), total weight of cable on reel, type and size of conductor, insulation type and thickness, voltage rating and manufacturer's identification number.

K. Shipping

Cable ends shall be adequately sealed with a water seal-type material and plastic end caps secured **by** tape to prevent the penetration of moisture. There shall be no water in the stranded conductor of the

cable when the reel is stripped. Reels shall be shipped upright. All shipments shall be prepaia, F.O.B. Lodi, California.

EQUIPMENT SPECIFICATIONS

600-VOLT XLPE TRIPLEX CABLE

GENERAL:

CABLE FURNISHED UNDER THESE SPECIFICATIONS SHALL BE LIMITED TO CROSS-LINKED POLYETHYLENE INSULATED CABLE RATED 600 VOLTS AND SUITABLE FOR INSTALLATION IN DUCTS OR FOR DIRECT BURIAL IN EARTH, IN WET OR DRY LOCATIONS, WITH NORMAL CONDUCTOR TEMPERATURES UP TO 90 DEGREES C. CABLES FURNISHED SHALL MEET THE REQUIREMENTS OF THE APPLICABLE NEMA, ICEA, AEIC AND ASTM STANDARDS, LATEST EDITION THEREOF, UNLESS OTHERWISE NOTED IN THIS SPECIFICATION.

CABLE:

A. CONDUCTOR:

THE CONDUCTOR SHALL BE ALUMINUM ALLOY, EC GRADE, 1/2 TO 3/4 HARD, CLASS B STRANDING.

B. INSULATION:

PHASE CONDUCTOR INSULATION SHALL BE SINGLE-PASS, BLACK, CROSS-LINKED POLYETHYLENE. THE NEUTRAL CONDUCTOR SHALL HAVE YELLOW XLPE INSULATION OR BLACK XLPE INSULATION WITH YELLOW EXTRUDED STRIPES.

C. ASSEMBLY:

THE ASSEMBLED CABLE SHALL CONSIST OF PHASE AND NEUTRAL CONDUCTORS TWISTED TOGETHER WITH A LAY NOT LESS THAN 50 NOR MORE THAN 60 TIMES THE OUTSIDE DIAMETER OF ONE OF THE PHASE CONDUCTORS- ALL CABLE ENDS SHALL BE SEALED TO PREVENT THE ENTRFNCE OF MOISTURE.

D. IDENTIFICFTION:

EACH CONDUCTOR SHALL HAVE A PERMANENT MARKING SHOWING THE MANUFACTURER'S NAME, VOLTAGE RATING, CONDUCTOR SIZE AND TYPE GF INSULATION.

E. TESTING AND GUARANTEE:

TESTING OF CABLE SHALL BE PERFORMED ACCORDING TO PROCEDURES SET FORTH BY THE ICEA, AEIC AND ASTM. CEPTIFIED COPIES OF PASS/FAIL TEST RESULTS SHALL BE SUPPLIED. ANY CABLE FOUND DEFECTIVE EITHER UPON INSPECTION, TESTING OR INSTALLATION WILL BE RETURNED AT THE MANUFACTURER'S EXPENSE.

F. SPECIFIC REQUIREMENTS:

CABLE SHPLL BE FURNISHED **ACCORDING** TO TPBLE I AS SHOWN BELOW. ANY CONDITIONAL BIGS SUCH AS "SUBJECT TO AVAILABILITY IN STOCK" **WILL BE** REJECTED.

CONDUCTOR **SIZE** PHASE (NEUTRAL)	CODE WORD	MATERIAL	NEMA **STANDARD** REEL CODE **NO.**
#2 (#2) AWG	RAMAPO/YES	ALUM.	3624
#1/0 (#1/0) AWG	BERGEN/YES	ALUM.	3424
350 **MCM** (#4/0) AWG	WESLEYAN/YES	ALUM.	7236

G. SHIPPING:

CABLE ENDS SHALL BE **ADEQUATELY** SEALED **WITH A** WGTER SEAL-TYPE **MATERIAL** AND PLASTIC END CAPS **SECURED** EY TAPE TO FREVENT **THE PENETRATION OF** MOISTURE. THERE SHALL BE NO WATER IN THE **STRANDED** CONDUCTOR **OF** THE CABLE WHEN THE REEL **IS** SHIPPED. ALL SHIPMENTS SHALL EE **PREPAID, F.O.B. LODI, CALIFORNIA.** REELS SHALL EE SHIPPED UPRIGHT.

REELS:

A. MAKEUP AND LENGTH:

THE **SPECIFIED** CONDUCTOR SHALL EE SUPPLIED ON NEMA STANDARD HEELS IN **ACCORDANCE WITH** TABLE **I.**

B. PACKAGING:

EACH CPFLE REEL SHALL HAVE ADEQUATE PROTECTIVE COVERING ACROSS THE FLANGES, SUCH **COVERING** TC CONSIST OF WOOD **MEMBERS** FROM FLANGE ***TO*** FLANGE **COVERING** THE ENTIRE CIRCUMFERENCE OF THE REEL (LAGGING), THE LAGGING SHALL BE NAILED TO THE FLFNGE PERIMETERS AND SHALL BE FURTHER SECURED WITH AT LEAST TWO STEEL BANDS AROUND THE REEL. EACH END OF THE CABLE SHALL RE FIRMLY SECURED TO THE REEL.

C. MARKING:

EACH REEL SHALL BE MARKED WITH A DURABLE LABEL SECURELY ATTACHED TO A FLANGE OF THE REEL AND PLAINY MARKED STATING THE DESTINATION, THE PURCHASER'S ORDER NUMBER, SHIPPING LENGTH OF CABLE ON REEL, TYPE AND SIZE OF CONDUCTORS, INSULATION TYPE AND THICKNESS, VOLTAGE RATING AND MANUFACTURER'S IDENTIFICATION NUMBER.